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EXAMINER	
RU, POWEN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/812,826	Applicant(s) RYAN, JIM G.
	Examiner Powen Ru	Art Unit 2194

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03/30/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20040330, 20060306*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

This is the initial office action based on the application filed on 3/30/2004. Claims 1-31 are currently pending and have been considered below.

Specification

1. The abstract of the disclosure is objected to as failing to comply with 37 CFR 1.72(a), because it exceeds 150 words in length (152 words). The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. Correction is required.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not). There are two Claim 25's: the first one will be referred as Claim 25A and the second one will be referred as Claim 25B in the prosecution. The applicant may retain Claim 25A as Claim 25, cancel Claim 25B but append as Claim 32.

3. Claim 29 is objected to because of the following informalities: "a actual frequency response" (page 26 line 19) should be "an actual frequency response". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 25B and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25B, depending upon Claim 24, recites the limitation "the threshold level" in page 26 line 1. There is insufficient antecedent basis for this limitation in the claim. The examiner considers the claim should depend upon Claim 25A where the limitation has been defined.

Claim 26, depending upon Claim 24, recites the limitation "the threshold level" in page 26 line 4. There is insufficient antecedent basis for this limitation in the claim. The examiner considers the claim should depend upon Claim 25A where the limitation has been defined.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 12-14, 19, 21-23, and 29-31 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility.

Claim 12 is a method claim. However, the final step “determining” does not produce a tangible result.

Claim 13-14, depending upon Claim 12, do not yield a tangible result by further specifying the monitored objects.

Claim 19, depending upon Claim 12, recites the final step “identifying” which does not produce a tangible result.

Claim 21 is a method claim. However, the final step “identifying” does not produce a tangible result.

Claim 22, depending upon Claim 21, recites the final step “determining” which does not produce a tangible result.

Claim 23, depending upon Claim 21, does not yield a tangible result by further specifying the frequency range.

Claim 29 is a method claim. However, the final step “associating” does not produce a tangible result.

Claim 30-31, depending upon Claim 29, do not yield a tangible result by further specifying the threshold .

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 12, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Marx et al. (4,955,729).

Claim 12: Marx et al. discloses an electronically-implemented method of determining whether a hearing instrument is removed from or inserted into a space (removal or attachment, col 1 lines 65-68), comprising: monitoring (e.g., responds to, col 5 line 5; inherently a system must be operable to monitor) the level of acoustic energy radiated by the hearing instrument (e.g., emitted by the earphone, col 2 line 20-25); monitoring the level of acoustic energy received by the hearing instrument (acoustic feedback, col 5 line 6) in response to the acoustic energy radiated by the hearing instrument; comparing (e.g., inherently before switching criteria, col 5 lines 25-30) the level of acoustic energy radiated by the hearing instrument to the level of acoustic energy received by the hearing instrument in response to the acoustic energy radiated by the hearing instrument; and determining (e.g., switching criteria, col 5 lines 25-30)

whether the hearing instrument is inserted into the space or removed from the space based on the comparison.

Claim 20: Marx et al. discloses a hearing instrument (e.g., hearing aid, col 5 lines 5-10) comprising means for monitoring (e.g., responds to, col 5 line 5; inherently a system must be operable to monitor) the level of acoustic energy radiated by the hearing instrument (e.g., emitted by the earphone, col 2 line 20-25); means for monitoring the level of acoustic energy received by the hearing instrument (acoustic feedback, col 5 line 6) in response to the acoustic energy radiated by the hearing instrument; and means for comparing (e.g., inherently before switching criteria, col 5 lines 25-30) the level of acoustic energy radiated by the hearing instrument to the level of acoustic energy received by the hearing instrument in response to the acoustic energy radiated by the hearing instrument and for determining (e.g., switching criteria, col 5 lines 25-30) whether the hearing instrument system is inserted into the space or removed (removal or attachment, col 1 lines 65-68) from the space based on the comparison. The examiner notes that it appears that the applicant is attempting to invoke 35 U.S.C. 112, 6th paragraph, with the use of means-plus-function language in the claim. However, the specification does not provide any specific structure for either of the features that could be read into the claim to limit the scope of the means to perform the claimed functions. Therefore, the examiner does not consider the specification to be adequate to invoke a 35 U.S.C. 112, 6th paragraph interpretation.

10. Claims 29-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Voix et al. (6,687,377).

Claim 29: Voix et al. discloses a method of determining whether a hearing instrument (e.g., hearing aid, col 5 lines 5-10) forms an acceptable seal with a user's ear (col 6 lines 53-55), comprising: obtaining a baseline frequency response of the hearing instrument configured in an acceptable seal (measure sound pressure levels ... because of a good seal, col 8 lines 42-48); obtaining a actual frequency response of the hearing instrument configured with the user's ear (measured sound pressure levels, col 9 line 33); comparing the baseline frequency response to the actual frequency response over a low frequency band (monitoring the calculated value of the sound level difference, col 8 lines 12-15); determining whether the actual frequency response is within a threshold level (predetermined sound pressure level difference, col 10 lines 8-12) of the baseline frequency response over the low frequency band; associating an acceptable seal (col 8 lines 45-48) with a determination that the actual frequency response is within a threshold level of the baseline frequency response over the low frequency band; and associating an unacceptable seal (insertion loss, col 4 lines 45-47) with a determination that the actual frequency response is not within a threshold level of the baseline frequency response over the low frequency band.

Claim 30: Voix et al. discloses a method as in Claim 29; and further discloses the threshold level is constant (average value, col 8 lines 58-60) over the low frequency band (selected range, col 8 lines 59-61).

Claim 31: Voix et al. discloses a method as in Claim 29; and further discloses the threshold level varies over the low frequency band (frequency dependent variation over the selected range, col 8 lines 59-61).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-2, 8-11, 13, 19, 21-22, and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marx et al. (4,955,729) in view of Voix et al. (6,687,377)

Claim 1: Marx et al. discloses a hearing instrument system for detecting the insertion (attachment, col 1 lines 65-68) or removal (col 1 lines 65-68) of a hearing instrument (e.g., hearing aid, col 5 lines 5-10) into a space, comprising: a first acoustic transducer (e.g., earphone 2, col 5 lines 5-10) configured to receive a first electrical signal and in response radiate (e.g., emitted by the earphone, col 2 line 20-25) acoustic energy; a second acoustic transducer (e.g., microphone 2, col 5 lines 5-10) configured to receive radiated acoustic energy (acoustic feedback, col 5 line 6) and in response generate a second electrical signal; second level detection circuitry (e.g., control element which respond ..., col 5 lines 30-35) coupled to the second acoustic transducer and operable to receive the second electrical signal and generate a second intensity signal (e.g., voltage signal, col 5 line 35); but does not specifically disclose level

detection circuitry coupled to the first acoustic transducer and signal processing circuitry coupled to the first and second level detection circuitry. However, Voix et al. discloses first level detection circuitry (e.g., control box 52, col 7 lines 30-35) coupled to the first acoustic transducer and operable to receive the first electrical signal and generate a first intensity signal (see Fig. 4); and further discloses signal processing circuitry (e.g., data processing unit 50, col7 lines 38-44) coupled to the both level detection circuitry and operable to receive intensity signals and compare them and determine whether the hearing instrument is inserted into the space, or removed from the space based on the comparison (e.g., determining ... acoustic seal, col 6 lines 53-59). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the extra circuitry. As Voix et al. clearly teaches that the extra level detection circuitry generates a reference signal (reference sound source 51, col 7 lines 20-25) and signal processing circuitry compare the data to determine (e.g., advising, col 8 lines 20-25) the status of the hearing instrument, one would have been motivated to add extra level detection circuitry and signal processing circuitry as taught by Voix et al. to Marx's hearing instrument system.

Claim 2: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; but Marx et al. does not specifically disclose a stable band differential. However, Voix et al. discloses the first (e.g., reference 44, col 8 lines 39-41) and second (e.g., probe 42, col 8 lines 39-41) electrical signals received by the first and second level detection circuitry correspond to a stable band differential (stable sound level difference ... over a pre-selected frequency range, col 10 lines 8-12). Therefore, it

would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain this value accordingly. As Voix et al. teaches that insertion loss can be estimated by the stable band differential (col 4 lines 45-50), one would have been motivated to use the stable band differential in Marx's hearing instrument system.

Claim 8: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; and Marx et al. further discloses that the system is operable to monitor (e.g., responds to, col 5 line 5; inherently a system must be operable to monitor) the level of acoustic energy radiated by the first transducer over a frequency band (e.g., frequency range, col 2 lines 30-32); monitor the level of acoustic energy received (feedback, col 5 lines 30-35) by the second acoustic transducer over a frequency band in response to the acoustic energy radiated by the first acoustic transducer when the hearing instrument is inserted into the space (e.g., attachment, col 1 lines 60-68); compare (e.g., switching criteria, col 5 lines 25-30) the level of acoustic energy received by the second acoustic transducer over a frequency band in response to the acoustic energy radiated by the first acoustic transducer to obtain first comparison data (e.g., predetermined sound level, col 5 lines 30-35); monitor the level of acoustic energy received by the second acoustic transducer over the frequency band in response to the acoustic energy radiated by the first acoustic transducer when the hearing instrument is removed from the space (e.g., removal, col 5 lines 5-10); compare (e.g., switching criteria, col 5 lines 25-30) the level of acoustic energy radiated by the second acoustic transducer to the level of acoustic energy received by the first acoustic transducer over the frequency band when the hearing instrument is removed from the space to obtain second

comparison data (e.g., increased sound level, col 5 lines 30-35); but Marx et al. does not specifically disclose how to identify stable band differentials. However, Voix et al. discloses stable band differentials (stable sound level difference ... over a pre-selected frequency range, col 10 lines 8-12) between the first comparison data and the second comparison data for the monitoring insertion and removal events. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to identify the values accordingly. As Voix et al. teaches that insertion loss can be estimated by the stable band differentials (col 4 lines 45-50), one would have been motivated to use the stable band differentials in Marx's hearing instrument system.

Claim 9: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; and Marx et al. further discloses that hearing instrument is a hearing aid (col 3 lines 8-10).

Claim 10: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; and Marx et al. further discloses that hearing instrument is a communications device (e.g., telephone receiver or headset, col 1 line 50).

Claim 11: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; and Marx et al. further discloses level detectors (Sound pressure converter c2/24-26); but Marx et al. does not explicitly disclose the bandpass filters. However, Voix et al. discloses bandpass filters (e.g., filter device adapted for a pre-selected frequency window, col 8 lines 37-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include bandpass filters in level detection circuitry. As only a range of frequency band is preferable for

measurement (col lines 25-30), one would have been motivated to apply Voix's bandpass filters to Marx's hearing instrument system.

Claim 13: Marx et al. discloses a method as in Claim 12; but does not specifically disclose a stable band differential. However, Voix et al. discloses a step monitoring stable band differential (stable sound level difference … over a pre-selected frequency range, col 10 lines 8-12). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to monitor this value accordingly. As Voix et al. teaches that insertion loss can be estimated by the stable band differential (col 4 lines 45-50), one would have been motivated to use the stable band differential in Marx's method.

Claim 19: Marx et al. discloses a method as in Claim 12; and further discloses steps of: monitoring (e.g., responds to, col 5 line 5; inherently a system must be operable to monitor) the level of acoustic energy radiated by the hearing instrument over a frequency band (e.g., frequency range, col 2 lines 30-32); monitoring the level of acoustic energy received by the hearing instrument over the frequency band in response to the acoustic energy radiated by the hearing instrument when the hearing instrument is inserted into the space (e.g., attachment, col 1 lines 60-68); comparing the level of acoustic energy radiated by the hearing instrument to the level of acoustic energy received by the hearing instrument (feedback, col 5 lines 30-35) over the frequency band when the hearing instrument is inserted into the space to obtain first comparison data (e.g., predetermined sound level, col 5 lines 30-35); monitoring the level of acoustic energy received by the hearing instrument over the frequency band in

response to the acoustic energy radiated by the hearing instrument when the hearing instrument is removed from the space (e.g., removal, col 5 lines 5-10); comparing (e.g., inherently before switching criteria, col 5 lines 25-30) the level of acoustic energy radiated by the hearing instrument to the level of acoustic energy received by the hearing instrument over the frequency band when the hearing instrument is removed from the space to obtain second comparison data (e.g., increased sound level, col 5 lines 30-35); but does not specifically disclose a stable band differential. However, Voix et al. discloses a step identifying stable band differentials (stable sound level difference … over a pre-selected frequency range, col 10 lines 8-12) between the first comparison data and the second comparison data for the monitoring insertion and removal events. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to identify the values to monitor insertion status accordingly. As Voix et al. teaches that insertion loss can be estimated by the stable band differentials (col 4 lines 45-50), one would have been motivated to use the stable band differentials in Marx's method.

Claim 21: Marx et al. discloses a method of determining whether a hearing instrument (e.g., hearing aid, col 5 lines 5-10) is removed from or inserted into (removal or attachment, col 1 lines 65-68) a space, comprising: monitoring (e.g., responds to, col 5 line 5; inherently a system must be operable to monitor) the level of acoustic energy radiated (e.g., emitted by the earphone, col 2 line 20-25) by the hearing instrument over a frequency band (e.g., frequency range, col 2 lines 30-32); monitoring the level of acoustic energy received by the hearing instrument (acoustic feedback, col 5 line 6)

over the frequency band in response to the acoustic energy radiated by the hearing instrument when the hearing instrument is inserted into the space; comparing the level of acoustic energy radiated by the hearing instrument to the level of acoustic energy received by the hearing instrument over the frequency band when the hearing instrument is inserted into the space to obtain first comparison data (e.g., predetermined sound level, col 5 lines 30-35); monitoring the level of acoustic energy received by the hearing instrument over the frequency band in response to the acoustic energy radiated by the hearing instrument when the hearing instrument is removed from the space; comparing the level of acoustic energy radiated by the hearing instrument to the level of acoustic energy received by the hearing instrument over the frequency band when the hearing instrument is removed from the space to obtain second comparison data (e.g., increased sound level, col 5 lines 30-35); but does not specifically disclose a stable band differential. However, Voix et al. discloses a step identifying stable band differentials (stable sound level difference ... over a pre-selected frequency range, col 10 lines 8-12) between the first comparison data and the second comparison data for the monitoring insertion and removal events. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to identify the values to monitor insertion status accordingly. As Voix et al. teaches that insertion loss can be estimated by the stable band differentials (col 4 lines 45-50), one would have been motivated to use the stable band differentials in Marx's method.

Claim 22: Marx et al. and Voix et al. disclose a method as in Claim 21; but Marx et al. does not specifically disclose steps of identifying stable band differential. However,

Voix et al. discloses steps of obtaining a ratio (sound level difference col 7 lines 40-45) of the first comparison data (e.g., reference 44, col 8 lines 39-41) to the second comparison data (e.g., probe 42, col 8 lines 39-41) and determining if the change in ratio over a bandwidth (pre-selected frequency range, col 10 lines 10-11) is within a defined range (predetermined sound pressure level difference, col 10 lines 8-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain the ratio and define a corresponding threshold. As Voix et al. teaches that insertion loss can be estimated by the stable band differentials (col 4 lines 45-50) and further discloses the detailed steps, one would have been motivated to use the steps suggested by Voix et al. in Marx's method.

Claim 24: Marx et al. discloses a hearing instrument system for determining (switching criteria c5/25-30) a hearing instrument seal (attachment, col 1 lines 65-68) with a user's ear, comprising a first acoustic transducer (e.g., earphone 2, col 5 lines 5-10) configured to receive a first electrical signal and in response radiate (e.g., emitted by the earphone, col 2 line 20-25) acoustic energy; a second acoustic transducer (e.g., microphone 2, col 5 lines 5-10) configured to receive radiated acoustic energy (acoustic feedback, col 5 line 6) and in response generate a second electrical signal; second level detection circuitry (e.g., control element which respond ..., col 5 lines 30-35) coupled to the second acoustic transducer and operable to receive the second electrical signal and generate a second intensity signal (e.g., voltage signal, col 5 line 35); but does not specifically disclose level detection circuitry coupled to the first acoustic transducer and signal processing circuitry coupled to the first and second level detection circuitry.

However, Voix et al. discloses first level detection circuitry (e.g., control box 52, col 7 lines 30-35) coupled to the first acoustic transducer and operable to receive the first electrical signal and generate a first intensity signal (see Fig. 4); and further discloses signal processing circuitry (e.g., data processing unit 50, col7 lines 38-44) coupled to both level detection circuitry and operable to receive the both intensity signals and compare a ratio of them to a baseline ratio (predetermined sound pressure difference, col 10 lines 8-12) to determine whether the hearing instrument has formed an acceptable seal with the user's ear (e.g., determining ... acoustic seal, col 6 lines 53-59). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the extra circuitry. As Voix et al. clearly teaches that the extra level detection circuitry generates a reference signal (reference sound source 51, col 7 lines 20-25) and signal processing circuitry compare the data to determine (e.g., advising, col 8 lines 20-25) the status of the hearing instrument, one would have been motivated to add extra level detection circuitry and signal processing circuitry as taught by Voix et al. to Marx's hearing instrument system.

Claim 25A: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 24; but Marx et al. does not specifically disclose signal processing circuitry and its operations. However, Voix et al. discloses that the signal processing circuitry is operable to determine whether the hearing instrument has formed an acceptable seal (e.g., col 8 lines 45-48) with the user's ear by determining whether the ratio (sound pressure level difference, col 10 lines 14-15) of the first and second intensity signals is within a threshold level of the baseline ratio (predetermined sound pressure difference,

col 10 lines 8-12) over a frequency band (e.g., frequency range, col 2 lines 30-32). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use signal processing circuitry to determine acceptable seal. As Voix et al. teaches that the level difference could serve to determine a good acoustic seal (col 8 lines 42-48), one would have been motivated to add the addition operations to Marx's hearing instrument system.

Claim 25B: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 25A (not Claim 24, see ***Claim Rejections - 35 USC § 112***); and Marx et al. further discloses threshold level is constant (e.g., predetermined sound level, col 5 lines 30-35) over the frequency band (frequency range, col 2 lines 29-31).

Claim 26: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 25A (not Claim 24, see ***Claim Rejections - 35 USC § 112***); but Marx et al. does not disclose variable threshold level. However, Voix et al. discloses that the threshold level varies over the frequency band (frequency dependent variation over the selected range, col 8 lines 59-61). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use variable threshold. As Voix et al. teaches that either an average value or a frequency dependent variation could provide the ratio (e.g., difference, col 8 lines 56-58) to determine a good acoustic seal (col 8 lines 42-48), one would have been motivated to choose this option in Marx's hearing instrument system.

Claim 27: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 24; and Marx et al. further discloses that the first acoustic transducer will

periodically radiate a notification tone (whistle tone, col 5 lines 43-45) upon determining that the hearing instrument has not formed an acceptable seal with the user's ear (removing the ear insert, col 6 lines 30-35).

Claim 28: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 24; and Marx et al. further discloses that hearing instrument is a hearing aid (col 3 lines 8-10).

13. Claims 3-7, 14-18, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marx et al. (4,955,729) in view of Voix et al. (6,687,377), and further in view of Kunugi et al. (4,644,292)

Claim 3: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; but neither discloses a specific frequency range with a upper limit less than 10 kHz. However, Kunugi et al. discloses a frequency band defining a lower frequency and an upper frequency, the upper frequency less than or equal to 10 kHz (8kHz, col 11 lines 54-56). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose upper frequency less than or equal to 10 kHz. As Voix et al. further teaches that any frequency range may be applicable (col 8 lines 25-30), one would have been motivated to use the upper limit suggested by Kunugi et al. for Marx's hearing instrument system.

Claim 4: Marx et al. and Voix et al. disclose a hearing instrument system as in Claim 1; and Marx et al. further discloses that the system is operable to switch off the hearing instrument upon detection that the hearing instrument is removed from the

space (e.g., removal, col 5 lines 5-10); but neither discloses that the signal processing circuitry is further operable to reduce a gain associated with the first acoustic transducer upon removal. However, Kunugi et al. discloses an automatic gain control operation that reduce gain of an amplifier upon a certain environmental change (e.g., col 10 lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reduce the gain gradually in addition to the available on-off operations. As Kunugi et al. teaches that the automatic gain control operation allows satisfactory sound reproduction in hearing sensation (col 3 lines 20-30), one would have been motivated to apply Kunugi's automatic gain control operation to Marx's hearing instrument system.

Claim 5: Marx et al., Voix et al. and Kunugi et al. disclose a hearing instrument system as in Claim 4; and Marx et al. further discloses that the system is operable to power off (switching off, col 5 lines 55-60) the hearing instrument if the signal processing circuitry does not detect an insertion into the space within a specified time period (predetermined period, col 7 lines 30-35) after the detection that the hearing instrument has been removed from the space.

Claim 6: Marx et al., Voix et al. and Kunugi et al. disclose a hearing instrument system as in Claim 4; and Marx et al. further discloses that the system is responsive upon insertion (e.g., attachment, col 1 lines 60-68); but does not teach explicitly about increasing gain. However, Kunugi et al. discloses an automatic gain control operation that increase gain of an amplifier upon a certain environmental change (e.g., col 6 lines 5-20). Therefore, it would have been obvious to one having ordinary skill in the art at the

time the invention was made to increase the gain gradually in addition to the available on-off operations. As Kunugi et al. teaches that the gain increasing operation is corresponding with the sensitivity characteristics of the human ear (col 6 lines 15-20), one would have been motivated to apply Kunugi's automatic gain control operation to Marx's hearing instrument system.

Claim 7: Marx et al., Voix et al. and Kunugi et al. disclose a hearing instrument system as in Claim 4; and Marx et al. further discloses that the system is responsive upon insertion (e.g., attachment, col 1 lines 60-68) and capable of waiting a specified time period (predetermined period, col 7 lines 30-35) after the detection; but does not teach explicitly about increasing gain. However, Kunugi et al. discloses an automatic gain control operation that increase gain of an amplifier upon a certain environmental change (e.g., col 6 lines 5-20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to increase the gain gradually in addition to the available on-off operations. As Kunugi et al. teaches that the gain increasing operation is corresponding with the sensitivity characteristics of the human ear (col 6 lines 15-20), one would have been motivated to apply Kunugi's automatic gain control operation to Marx's hearing instrument system.

Claim 14: Marx et al. and Voix et al. disclose a method as in Claim 13; but neither discloses a specific frequency range with a upper limit less than 10 kHz. However, Kunugi et al. discloses a frequency band defining a lower frequency and an upper frequency, the upper frequency less than or equal to 10 kHz (8kHz, col 11 lines 54-56). Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to choose upper frequency less than or equal to 10 kHz. As Voix et al. further teaches that any frequency range may be applicable (col 8 lines 25-30), one would have been motivated to use the upper limit suggested by Kunugi et al. for Marx's method.

Claim 15: Marx et al. and Voix et al. disclose a method as in Claim 12; and Marx et al. further discloses a step to switch off the hearing instrument upon detection that the hearing instrument is removed from the space (e.g., removal, col 5 lines 5-10); but neither discloses gain reducing step. However, Kunugi et al. discloses an automatic gain control operation that reduce gain of an amplifier upon a certain environmental change (e.g., col 10 lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reduce the gain gradually in addition to the available on-off operations. As Kunugi et al. teaches that the automatic gain control operation allows satisfactory sound reproduction in hearing sensation (col 3 lines 20-30), one would have been motivated to apply Kunugi's automatic gain control operation to Marx's method.

Claim 16: Marx et al., Voix et al. and Kunugi et al. disclose a method as in Claim 15; and Marx et al. further discloses a step to power off (switching off, col 5 lines 55-60) the hearing instrument if a determination that an insertion into the space does not occur within a specified time period (predetermined period, col 7 lines 30-35) after the detection that the hearing instrument has been removed from the space.

Claim 17: Marx et al., Voix et al. and Kunugi et al. disclose a method as in Claim 15; and Marx et al. further discloses that the system is responsive upon insertion (e.g.,

attachment, col 1 lines 60-68); but does not teach explicitly about increasing gain. However, Kunugi et al. discloses an automatic gain control operation that increase gain associated with acoustic energy upon a certain environmental change (e.g., col 6 lines 5-20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to increase the gain gradually in addition to the available on-off operations. As Kunugi et al. teaches that the gain increasing operation is corresponding with the sensitivity characteristics of the human ear (col 6 lines 15-20), one would have been motivated to apply Kunugi's automatic gain control operation to Marx's method.

Claim 18: Marx et al., Voix et al. and Kunugi et al. disclose a method as in Claim 5; and Marx et al. further discloses that the system is responsive upon insertion (e.g., attachment, col 1 lines 60-68) and capable of waiting a specified time period (predetermined period, col 7 lines 30-35) after the detection; but does not teach explicitly about increasing gain. However, Kunugi et al. discloses an automatic gain control operation that increase gain associated with acoustic energy upon a certain environmental change (e.g., col 6 lines 5-20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to increase the gain gradually in addition to the available on-off operations. As Kunugi et al. teaches that the gain increasing operation is corresponding with the sensitivity characteristics of the human ear (col 6 lines 15-20), one would have been motivated to apply Kunugi's automatic gain control operation to Marx's hearing instrument system.

Claim 23: Marx et al. and Voix et al. disclose a method as in Claim 1; but neither discloses a specific frequency range with a upper limit less than or equal to 10 kHz. However, Kunugi et al. discloses a frequency band defining a lower frequency and an upper frequency with the upper frequency less than or equal to 10 kHz (8kHz, col 11 lines 54-56). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose upper frequency less than or equal to 10 kHz. As Voix et al. further teaches that any frequency range may be applicable (col 8 lines 25-30), one would have been motivated to use the upper limit suggested by Kunugi et al. for Marx's method.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Malcolm, Jr. et al. (6,405,093) discloses signal amplitude control circuitry and methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Powen Ru whose telephone number is 571-270-1050. The examiner can normally be reached on Monday-Thursday 7:30am-3:30pm EST/EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Myhre can be reached on 571-270-1065. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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PR
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